

to test these devices to determine whether or not they function properly. This is so because as the size of the devices decreases, the electrical resistance through these devices also decreases. Therefore, the sensitivity of the test measurements, and, relatedly, accuracy of the electrical signals reaching the devices during testing, must increase accordingly.

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However, the use of copper-based metallurgy in microelectronic devices increases the difficulty of providing the devices with an accurate signal. Unlike test connections made to the aluminum probe pads of microelectronic devices having aluminum-based metallurgy, test connections made to copper probe pads are problematic due to the formation of layers of copper oxide on the probe pads and the test probes. These copper oxide layers increase the contact resistance between the test probes and probe pads, decreasing the voltage applied across the devices. The reduction in voltage decreases the accuracy and sensitivity of the measurements made during testing and often leads to false failure determinations.

The resistance caused by the layers of copper oxide and other materials is commonly referred to as "contamination resistance." Various systems and methods have been developed for measuring contamination resistance. For example, Japanese Publication No. 11-133075 is directed to a system for and method of determining whether or not the contamination resistance of one or more probe pads is too large to obtain useful measurement data from a device under test (DUT). The system comprises a probe card having a plurality of probes, or needles, for testing a DUT having a plurality of probe pads. The probe card provides a pair of probes for contacting each probe pad of the DUT. The pair of probes associated with each probe pad are spaced from one another and contact the corresponding probe pad at different locations.

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